

Performance Enhancement of Deicing Systems with the Use of an Anti-Ice Nano-Coating, Phase II

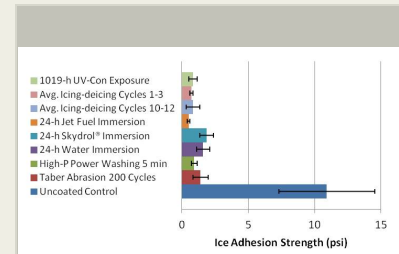
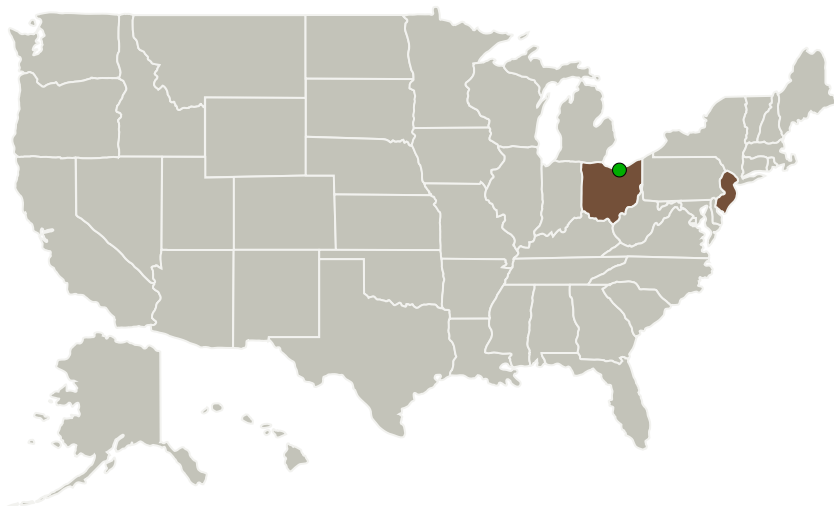
Completed Technology Project (2017 - 2020)



Project Introduction

The proposed program addresses NASA's need for a new generation of icing mitigation technology for manned and unmanned vehicles. The state of the art active de-icing method on leading edges involves either an electrical, pneumatic or vibration induced debonding of accumulated ice. There is a need for an anti-ice coating that functions synergistically with active de-icing methods. The advantages are reduced power consumption, improved service life of mechanical components, lighter electronics and extra protection in case of failure of active device. The Phase I program has addressed this need and technology gap, and has demonstrated the feasibility of combining a durable anti-ice coating with an active deicing device, thereby creating an integrated de-icing system. Icing tunnel testing results demonstrated that the coating provides improved de-icing efficiency, along with a reduction in power consumption of the active de-icing device. In collaboration with a manufacturer of active de-icing systems and a company developing advanced technologies to enhance aircraft performance and safety, the Phase II effort will refine the coating composition and application characteristics for use on aircraft so as to meet the stringent requirements of the aerospace and aeronautic industry. Further, we will establish a product specification of an anti-ice coating system for use with active de-icing systems and develop protocols for applying the coating at both OEM sites and field applications. The success of the program will lead to prevention of ice buildup on aircraft leading edges, improve aircraft safety, and reduce energy consumption during deicing procedures.

Primary U.S. Work Locations and Key Partners



Performance Enhancement of Deicing Systems with the Use of an Anti-Ice Nano-Coating, Phase II

Table of Contents

Project Introduction	1
Primary U.S. Work Locations and Key Partners	1
Project Transitions	2
Images	2
Organizational Responsibility	2
Project Management	2
Technology Maturity (TRL)	2
Technology Areas	3
Target Destinations	3

Performance Enhancement of Deicing Systems with the Use of an Anti-Ice Nano-Coating, Phase II

Completed Technology Project (2017 - 2020)



Organizations Performing Work	Role	Type	Location
NEI Corporation	Lead Organization	Industry Small Disadvantaged Business (SDB)	Piscataway, New Jersey
● Glenn Research Center(GRC)	Supporting Organization	NASA Center	Cleveland, Ohio

Primary U.S. Work Locations

New Jersey	Ohio
------------	------

Project Transitions

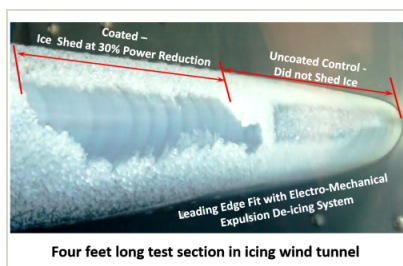
▶ **April 2017:** Project Start

✓ **January 2020:** Closed out

Closeout Documentation:

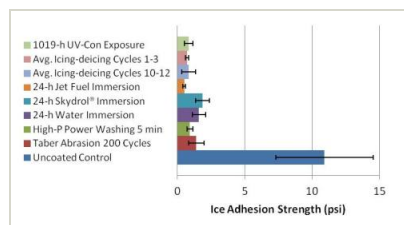
- Final Summary Chart(<https://techport.nasa.gov/file/141004>)

Images



Briefing Chart Image

Performance Enhancement of Deicing Systems with the Use of an Anti-Ice Nano-Coating, Phase II Briefing Chart Image (<https://techport.nasa.gov/image/126165>)



Final Summary Chart Image

Performance Enhancement of Deicing Systems with the Use of an Anti-Ice Nano-Coating, Phase II (<https://techport.nasa.gov/image/132230>)

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

NEI Corporation

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

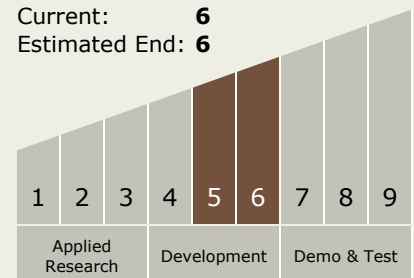
Carlos Torrez

Principal Investigator:

Jiong Liu

Technology Maturity (TRL)

Start: 5
Current: 6
Estimated End: 6



Performance Enhancement of Deicing Systems with the Use of an Anti-Ice Nano-Coating, Phase II

Completed Technology Project (2017 - 2020)



Technology Areas

Primary:

- TX08 Sensors and Instruments
 - └ TX08.2 Observatories
 - └ TX08.2.1 Mirror Systems

Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System